SEMIANNUAL STATUS AND

FINAL TECHNICAL REPORT

NASA Grant NAG 5-965

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Title: "A Unique Planetary Nebula Ejection from a Hot DA White Dwarf"/ "Ultraviolet Spectroscopy of Galactic Globular Clusters"

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FINAL REPORT ON NASA GRANT NAG 5-965

TO THE UNIVERSITY OF ARIZONA

Principal Investigator: James Liebert, Steward Observatory

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The project entitled "A Unique Planetary Nebula Ejection from a Hot DA White Dwarf," supported under the NASA Grant NAG 5-965 for research with the International Ultraviolet Explorer Observatory covering the period 7/1/88 - 6/1/89, has been completed successfully. Two papers appeared last year in The Astrophysical Journal, reporting and analyzing results of the IUE observations. In the first of these, the properties of the unusual planetary nebula are presented in detail (Liebert et al. 1989). In the second paper, Dopita and Liebert (1989) utilize a nebula photoionization model to refine parameters and propose a new model for the object. We also have a successful proposal with the Hubble Space Telescope to obtain imaging of the object, but the status of this followup project is in doubt due to the reduced imaging capabilities of the HST.

In July, 1989, a new observing proposal entitled, "Ultraviolet Spectroscopy of Galactic Globular Cluster" is being supported at Steward Observatory as a continuation of NAG 5-965. The coauthor of this proposal is Dr. Michael Rich of Columbia University. The first three IUE shifts (sets of observations) were obtained successfully with the satellite in August and October of 1989, and in July 1990. Since only two globular clusters were clearly detected in the observations with the short wavelength (SWP) camera, we decided to finish the two year project, instead of publishing preliminary results. Note that detections for these clusters were anticipated only if they contained very hot evolved stars, and it is somewhat surprising that any of these systems have been detected.

The second year of the observing project has been funded in separate awards to Dr. Rich and myself. Because of the change in procedure, my new award is not a continuation of the old contract, which expires September 30, 1990. This is therefore the final report on this contract, but the results of the science will be discussed with the new contract.

References:

Dopita, M. A. and Liebert, J. 1989, Astrophys. J., **347**, 910

Liebert, J., Green, R. F., Bond, H. E., Holberg, J. A., Wesemael, F., Fleming, T. A. and Kidder, K. 1989, Astrophys. J., **346**, 251.